

6. THE CLAIMS

It is claimed:

1. A memory module for storing data, including:

- a) a circuit board having a plurality of electrical terminals;
- b) a volatile memory device mounted on the circuit board; and
- c) a radio transmitter mounted on the circuit board, the radio transmitter operable to transmit information.

2. A memory module for storing data, comprising:

- a) a circuit board having a plurality of electrical terminals;
- b) a volatile memory device mounted on the circuit board;
- c) a non-volatile memory device mounted on the circuit board, the non-volatile memory device storing memory module information; and
- d) a radio transmitter mounted on the circuit board, the radio transmitter operable to receive at least a portion of the information from the non-volatile memory device and transmit the at least a portion of the memory module information to a radio receiver.

3. The memory module of claim 2, wherein the volatile memory device is a dynamic random access memory (DRAM) device.

4. The memory module of claim 2, wherein the volatile memory device is a synchronous dynamic random access memory (SDRAM) device.

0001950-101901
100101-0561000

5. The memory module of claim 2, wherein the non-volatile memory device is an electrically programmable read only memory (EPROM).

6. The memory module of claim 2, wherein the non-volatile memory device is an electrically erasable programmable read only memory (EEPROM).

7. The memory module of claim 2, wherein the non-volatile memory device is a serial electrically erasable programmable read only memory (SEEPROM).

8. The memory module of claim 2, wherein the non-volatile memory is connected to the radio transmitter via an I²C bus.

9. The memory module of claim 2, wherein the radio transmitter is a radio transceiver.

10. The memory module of claim 9, further comprising:

e) a processor that is mounted on the circuit board, the processor being operable to determine the signal strength of a radio signal received from a radio transmitter.

11. The memory module of claim 9, further comprising:

e) a processor that is mounted on the circuit board, the processor being operable to determine the propagation delay of a radio signal received from a radio transmitter.

12. The memory module of claim 9, wherein the radio transceiver is operable to receive radio signals from a first radio transmitter and a second radio transmitter.

13. The memory module of claim 9, further comprising:

- 5 e) a processor that is mounted on the circuit board, the processor being operable to determine the signal strength of a radio signal received from a first transmitter and the signal strength of a radio signal received from a second transmitter.

14. The memory module of claim 9, further comprising:

- 10 e) a processor that is mounted on the circuit board, the processor being operable to determine the signal strength of a radio signal received from a first transmitter, the signal strength of a radio signal received from a second transmitter, and the location of the memory module based upon the determined signal strengths.

15. The memory module of claim 9, further comprising:

- 15 e) a processor that is mounted on the circuit board, the processor being operable to determine the propagation delay of a radio signal received from a first transmitter and the propagation delay of a radio signal received from a second transmitter.

20 16. The memory module of claim 9, further comprising:

- e) a processor that is mounted on the circuit board, the processor being operable to determine the propagation delay of a radio signal received from a first transmitter, the propagation delay of a radio signal received from a second transmitter, and the

location of the memory module based upon the determined signal propagation delays.

17. The memory module of claim 9, further comprising:

- 5 e) a processor that is mounted on the circuit board, the processor being operable to determine the signal strength and the propagation delay of a radio signal received from a first transmitter and the signal strength and the propagation delay of a radio signal received from a second transmitter.

18. The memory module of claim 9, further comprising:

- 10 e) a processor that is mounted on the circuit board, the processor being operable to determine the signal strength and the propagation delay of a radio signal received from a first transmitter, the signal strength and the propagation delay of a radio signal received from a second transmitter, and the location of the memory module based upon the determined signal strengths and propagation delays.

15 a, 19. A memory module for storing data, comprising:

- 20 a) a circuit board having a plurality of electrical terminals;
b) a volatile memory device mounted on the circuit board; and
c) a radio transmitter mounted on the circuit board, the radio transmitter including a non-volatile memory cell for storing memory module information, the radio transmitter being operable to transmit at least a portion of the memory module information to a radio receiver.

20. The memory module of claim 19, wherein the radio transmitter is a radio transceiver.

21. The memory module of claim 20, further comprising:

- 5 d) a processor that is mounted on the circuit board, the processor being operable to determine the signal strength of a radio signal received from a radio transmitter.

22. The memory module of claim 20, further comprising:

- 10 d) a processor that is mounted on the circuit board, the processor being operable to determine the propagation delay of a radio signal received from a radio transmitter.

23. The memory module of claim 20, wherein the radio transceiver is operable to receive radio signals from a first radio transmitter and a second radio transmitter.

24. The memory module of claim 20, further comprising:

- 15 d) a processor that is operable to determine the signal strength of a radio signal received from a first transmitter and the signal strength of a radio signal received from a second transmitter.

25. The memory module of claim 20, further comprising:

- 20 d) a processor that is operable to determine the signal strength of a radio signal received from a first transmitter, the signal strength of a radio signal received from a second transmitter, and the location of the memory module based upon the

determined signal strengths.

26. The memory module of claim 20, further comprising:

- 5 d) a processor that is operable to determine the propagation delay of a radio signal received from a first transmitter and the propagation delay of a radio signal received from a second transmitter.

27. The memory module of claim 20, further comprising:

- 10 d) a processor that is operable to determine the propagation delay of a radio signal received from a first transmitter, the propagation delay of a radio signal received from a second transmitter, and the location of the memory module based upon the determined signal propagation delays.

28. The memory module of claim 20, further comprising:

- 15 d) a processor that is operable to determine the signal strength and the propagation delay of a radio signal received from a first transmitter and the signal strength and the propagation delay of a radio signal received from a second transmitter.

29. The memory module of claim 20, further comprising:

- 20 d) a processor that is operable to determine the signal strength and the propagation delay of a radio signal received from a first transmitter, the signal strength and the propagation delay of a radio signal received from a second transmitter, and the location of the memory module based upon the determined signal strengths and

propagation delays.

30. A computer system for processing data, comprising:

a) a memory module for storing data, including:

- 5
- 1) a circuit board having a plurality of electrical terminals;
 - 2) a volatile memory device mounted on the circuit board;
 - 3) a radio transmitter mounted on the circuit board, the radio transmitter operable to transmit information; and

10 b) a radio receiver that is operable to receive the information from the radio transmitter.

31. The computer system of claim 30 wherein the radio receiver is coupled to a processor that is operable to determine the signal strength of a radio signal transmitted from the radio transmitter.

15
end
a,
32. The computer system of claim 30, wherein the radio receiver is coupled to a processor that is operable to determine the propagation delay of a radio signal transmitted from the radio transmitter.

20
a
33. The computer system of claim 30, wherein the radio receiver is coupled to a processor that is operable to determine the signal strength and the propagation delay of a radio signal transmitted from the radio transmitter.

34. The computer system of claim 30, wherein the radio receiver is coupled to a processor that is operable to determine the location of the memory module.

35. A computer system comprising:

a) a memory module for storing data, including:

1) a circuit board having a plurality of electrical terminals;

2) a volatile memory device mounted on the circuit board;

3) a non-volatile memory device mounted on the circuit board and storing memory module information; and

4) a radio transmitter mounted on the circuit board, the radio transmitter operable to receive at least a portion of the memory module information from the non-volatile memory device and transmit the at least a portion of the memory module information; and

b) a radio receiver that is operable to receive the at least a portion of the memory module information from the radio transmitter.

36. The computer system of claim 35, wherein the radio receiver is coupled to a processor that is operable to determine the signal strength of a radio signal transmitted from the radio transmitter.

37. The computer system of claim 35, wherein the radio receiver is coupled to a processor that is operable to determine the propagation delay of a radio signal transmitted

from the radio transmitter.

38. The computer system of claim 35, wherein the radio receiver is coupled to a processor that is operable to determine the signal strength and the propagation delay of a radio signal transmitted from the radio transmitter.

39. The computer system of claim 35, wherein the radio receiver is coupled to a processor that is operable to determine the location of the memory module.

40. A method of determining the size of a memory module in a computer system, comprising:

- a) transmitting memory module information from a radio transmitter that is mounted on the circuit board of the memory module to a radio receiver;
- b) receiving the memory module information with a radio receiver; and
- c) utilizing the received memory module information to determine the size of the memory module.

41. The method of claim 40, further comprising:

- d) using the received memory module information to configure a memory controller.

42. A method of determining a characteristic of a memory module in a computer system, comprising:

- 5
- a) transmitting memory module information from a radio transmitter that is mounted on the circuit board of the memory module to a radio receiver;
 - b) receiving the memory module information with a radio receiver; and
 - c) utilizing the received memory module information to determine the characteristic of the memory module.

43. The method of claim 42, further comprising:

- d) using the received memory module information to configure a memory controller.

10 44. A method of determining the location of a memory module within a computer system, comprising:

- a) determining the signal strength of a radio signal; and
- b) based upon the determined signal strength, determining the location of the memory module.

15 45. A method of determining the location of a memory module within a computer system, comprising:

- sub
an
- a) determining the signal strength of a first radio signal;
 - b) determining the signal strength of a second radio signal; and
 - c) based upon the determined signal strengths, determining the location of the memory module.
- 20

46. A method of determining the location of a memory module within a computer system, comprising:

- a) determining the propagation delay of a radio signal; and
- b) based upon the determined propagation delay, determining the location of the memory module.

47. A method of determining the location of a memory module within a computer system, comprising:

- a) determining the propagation delay of a first radio signal;
- b) determining the propagation delay of a second radio signal; and
- c) based upon the determined propagation delays, determining the location of the memory module.

48. The memory module of claim 1, wherein the radio transmitter is operable to transmit information that indicates that the memory module failed a test.

49. The memory module of claim 1, wherein the radio transmitter is operable to transmit information that indicates that the memory module failed self-test.

50. The memory module of claim 1, wherein the radio transmitter is operable to transmit information that indicates that the memory module failed an interconnect test.

51. The memory module
information that indicates

THE UNIVERSITY OF CHICAGO